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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,466	01/15/2004	Masahiko Sugimoto	0649-0934P	5046

7590 07/25/2006

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WASHINGTON, DC 20007

EXAMINER
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QUIETT, CARRAMAH J

ART UNIT	PAPER NUMBER
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2622

DATE MAILED: 07/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/757,466	SUGIMOTO, MASAHIKO	
	<b>Examiner</b>	<b>Art Unit</b>	
	Carramah J. Quiett	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-8 and 14-16 is/are allowed.
- 6) ☐ Claim(s) 1,4,5,9,12 and 13 is/are rejected.
- 7) ☒ Claim(s) 2-3 and 10-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06/19/2006 has been entered.

### ***Response to Amendment***

2. The amendment(s), filed on 06/19/2006, have been entered and made of record. Claims 1-16 are now pending.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1 and 9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Specification***

4. The disclosure is objected to because of the following informalities:

In second paragraph on page 6, please change "high-sensitive" to "high-sensitivity" and "low-sensitive" to "low-sensitivity".

In the last paragraph on page 9, please change "inferred-ray" to "infrared".

Please check and correct other typographical and/or grammatical errors, which may appear in the disclosure. Appropriate correction is required.

### ***Claim Objections***

5. Claims 1-3 and 9 are objected to because of the following informalities:

For claims 1 and 9, please change the term “inferred-ray” to “infrared”

For claims 2 and 3, please change “high-sensitive” to “high-sensitivity” and “low-sensitive” to “low-sensitivity”.

Please check and correct other typographical and/or grammatical errors which may appear in the other claims. Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. **Claims 1, 4-5, 9 and 12-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fossum et al. (U.S. Pat. #6,137,100) in view of Murakami (JP Pub. #06-178198) and Inai et al. (U.S. Pat. #4,437,111).

As for **claim 1**, Fossum discloses a the solid-state imaging element has a plurality of pixels (col. 1, lines 5-7), each of the pixels is divided into a main pixel (fig. 1B, 110), which has a first area for obtaining a high-sensitivity image signal, and a sub-pixel (fig. 1B, 112, 114, or 116), which has a second area which is smaller than the first area, for obtaining a low-sensitivity image signal (col. 2, lines 38-59). Fossum teaches that image quality and signal-to-noise ratio of the color image signal can be improved by changing the effective area of each color pixel (col. 1, lines 20-32) or applying separate gains for separate spectral band channels (col. 1, lines 65-66).

Although Fossum discloses a means for the signal processing of an image while it is readout from the sensor in order to improve the quality of the image, he does not teach a digital camera comprising: a diaphragm, which controls an amount of incident light by varying a stop-amount; a controller, which individually controls a gain amount of the high-sensitivity image

signal and a gain amount of the low-sensitivity image signal in response to the stop-amount of the diaphragm; and a synthesizing processor, which synthesizes the controlled high-sensitivity image signal and the controlled low-sensitivity image signal. Fossum also does not expressly teach a digital camera wherein the incident light is filtered by an infrared cutting filter so as to include only an optical wavelength.

In a similar field of endeavor, Murakami discloses a solid-state image pick up device that comprises: a camera lens (fig. 2, ref. 1) with a diaphragm, which controls an amount of incident light by varying a stop-amount (abstract); a solid-state imaging element (fig. 2, ref. 3a, 3b, 3c), which receives the incident light passed through the diaphragm. Murakami's solid-state image pick up device also includes a storage device (fig. 2, ref. 6), which stores stop value information to individually control a gain amount of the high-sensitivity image signal and a gain amount of the low-sensitivity image signal in response to the stop-amount of the diaphragm (abstract, paragraph 9); an processing/encoding circuit (fig. 2, circuit 7), which synthesizes the controlled high-sensitivity image signal and the controlled low-sensitivity image signal, and outputted as a video signal (paragraph 2). The systems of Fossum and Murakami each have a solid state-imaging element and implement (or is capable of implementing) gain control (Fossum, col. 1, lines 65-66; Murakami, Abstract). Additionally, Murakami's system utilizes solid-state element(s) in a digital camera. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Murakami's solid-state image pickup device with Fossum's solid-state image sensor for correcting the change of the sensitivity of a solid-state image pickup element due to the stop value of a camera lens (Murakami, Abstract).

Also, in a similar field of endeavor, Inai teaches a digital camera (fig. 3) wherein the incident light is filtered by an infrared cutting filter (3) so as to include only an optical wavelength (col. 2, lines 22-34). In light of the teaching of Inai, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify solid-state imaging element of Fossum as well as the digital camera of Murakami with an infrared cutting filter in order to provide an option for producing a monochrome image signal (Inai, col. 1, lines 44-68).

As for **claim 4**, Fossum, as modified by Murakami and Inai, teaches an image sensor with a plurality of pixels are arranged in an array shape (Fossum, claim 1).

As for **claim 5**, Fossum, as modified by Murakami and Inai, also discloses an image sensor wherein each of the pixels is divided into the main pixel and the sub-pixel by an element-separating band deviated from the center of the pixel. This feature is clearly shown in figures 1B and 1D.

Regarding **claims 9 and 12-13**, these claims are method claims corresponding to the apparatus claims 1 and 4-5, respectively. Therefore, method claims 9 and 12-13 are analyzed and rejected as previously discussed with respect to claims 1 and 4-5, respectively.

#### ***Allowable Subject Matter***

8. **Claims 2-3 and 10-11** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

For **claim 2**, the prior art does not teach or fairly suggest the digital camera according to claim 1, wherein the controller increases the gain amount of the high-sensitive image signal and

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decreases the gain amount of the low-sensitive image signal when the diaphragm is set to an open side, whereas the controller decreases the gain amount of the high-sensitive image signal and increases the gain amount of the low-sensitive image signal when the diaphragm is set to a small-stop side.

For **claim 3**, the prior art does not teach or fairly suggest the digital camera according to claim 1, wherein when the controller increases the gain amount of the low-sensitive image signal, the controller decreases a synthesizing ratio of the low-sensitive image signal synthesized with the high-sensitive image signal.

Regarding **claims 10-11**, these claims are method claims corresponding to the apparatus claims 2-3, respectively. Therefore, method claims 10-11 are analyzed as previously discussed with respect to claims 2-3, respectively.

9. **Claims 6-8 and 14-16** are allowed.

For **claims 6-8**, the prior art does not teach or fairly suggest a digital camera comprising: a diaphragm, which controls an amount of incident light by a stop-amount; a solid-state imaging element, which receives the incident light passed through the diaphragm, said solid-state imaging element having a plurality of pixels, and each of the pixels being divided into a main pixel, which has a first area for obtaining a high-sensitivity image signal, and a sub-pixel, which has a second area, which is smaller than the first area, for obtaining a low-sensitivity image signal; *a controller, which operates in such a manner the smaller a stop amount of the diaphragm becomes, the smaller a synthesizing ratio of the low-sensitive image signal with respect to the high-sensitive image signal is decreased*; and a synthesizing processor, which synthesizes the high-sensitivity image signal with the low-sensitivity image signal.

Regarding **claims 14-16**, these claims are method claims corresponding to the apparatus claims 6-8, respectively. Therefore, method claims 14-16 are analyzed and allowed as previously discussed with respect to claims 6-8, respectively.


### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carramah J. Quiett whose telephone number is (571) 272-7316. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CJQ  
July 20, 2006

  
NGOC-YEN VU  
SUPERVISORY PATENT EXAMINER